Technical Questions

Preparation for Finance Interviews

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Technical Questions: Introduction

Technical questions are part of almost every finance interview. While the level of difficulty of these questions vary from firm to firm, and will change based on a candidates background, all interviewees will undoubtedly be quizzed on technical questions in at least one of the rounds. This guide is a fairly exhaustive compilation of the most common technical questions in finance interviews. Obviously, you will not encounter every question, however, the interview may also contain variations or new questions altogether. This guide was created to provide a quick review for a fraction of the price of most finance guides. Clearly, the more detailed and accurate responses you give, the more likely you will “wow” your interviewer.

The questions in this guide are broken down into the following categories: Accounting / Finance / Valuation, Stocks, Bonds / Interest Rates, Currencies, Options / Derivatives, and Mergers & Acquisitions. These categories are then divided into basic, intermediate and advanced concepts. The questions you are most likely to be asked are indicated in **bold**. Obviously, you should focus your studies on the relevant industry that you are trying to enter. If you are preparing for a Sales and Trading interview, you should focus on stocks, bonds/interest rates, currencies, and options/derivatives. For Investment Banking positions you should have a general background in all of those categories, but you are more likely to encounter questions from the Accounting/Finance/Valuation and the Mergers and Acquisitions section.

The final category is the brainteasers section. Getting brainteasers can definitely rattle you in an interview. In some cases, an interviewer will give a brain teaser if they are not a big fan of you or to see how you react under pressure. What is more important than actually getting the answer to the teaser correct is the way you think through the problems -- they want to see how your mind works analytically. See the examples for more information.

You will soon find out that interviews are a game. Your interviewer will likely push you to see how far you can go until you don’t know an answer -- and that’s a good thing. You can have a 4.0 with a double major in finance and econ from Wharton, but you still know nothing compared to the person on the other side of the table. Keep that in mind, and just prepare for these questions to the best of your ability. Remember when studying these questions, you <u>cannot</u> prepare for everything that interviewers may ask. They will always be coming up with new questions and new twists on older concepts so it is important that you try and understand the concepts behind the answers, rather than just memorizing them. If you come to a question you do not understand, try to do some research and develop a deeper understanding. The explanations here are kept intentionally brief. Your answers to these questions should not take more than 30 seconds to a minute for most. Again, it is a game to prove you have done your homework. Answer their question and move on. Do not try and B-S your way through technical questions. Do not waste your interviewer’s time, but do not apologize. Ask them if they can explain it to you. Be confident in what you know and don’t know. You will learn on the job and that is what you need to prove you have the ability to do. If you get into questions from the advanced section of this guide, chances are that your interviewer is trying to push you to see how far they can take you, and how you respond to pressure. The key is... Remain calm, cool and collected.

Finally, in most cases you cannot “ding yourself” by failing to answer a technical question. However, you can definitely knock yourself out of contention by answering a fit or behavioral question in an undesirable manner. Most of the time truly connecting with your interviewer on a personal level and showing you have the drive, passion and ability to learn in this crazy business can outweigh a misstep on a technical question (just don't stumble too much!)

The first bullets of each question include the definitions and information about the question. The final bullet in italics is an example of what you could say to your interviewer to answer the question, followed by bullets to potential follow-up questions.

Accounting, Finance and Valuation

Basic

What are the three main financial statements?

- Income Statement
  - Revenues – COGS – Expenses = Net Income
- Balance Sheet
  - Assets = Liabilities + Shareholder Equity
- Statement of Cash Flows
  - Beginning Cash + CF from Operations + CF from Investing + CF from Financing = Ending Cash
- *The three main financial statements are the income statement, the balance sheet, and the statement of cash flows.*

How are the three main financial statements connected?

- See exhibit 1 for a visual
- *There are many links between the three financial statements. Starting with the income statement, the last line item is net income. Net income is added to cash flow from operations on the cash flow statement. Beginning cash balance is cash from the balance sheet in the prior period. After making adjustments within cash flow from operations, investing and financing, the ending cash balance becomes the cash on the current period's balance sheet under assets. Net income (minus any dividends paid) flows from the income statement onto the retained earnings column (shareholder's equity) of the balance sheet, causing the balance sheet to balance.*
- Some other connections are as follows
  - Interest expense on the income statement is calculated from the long term debt on the balance sheet
  - Depreciation on both the income statement and cash flow statement is calculated based on property, plant and equipment, from the balance sheet
  - Change in working capital on the cash flow statement is calculated from changes in current assets and current liabilities on the balance sheet

Walk me through the major line items of an Income Statement.

Revenues
- Cost of Goods Sold
Gross Margin
-Operating Expenses
Operating Income
-Other Expenses
-Income Taxes
Net Income

- *The first line of the income statement would be revenues or sales. From that you subtract cost of goods sold which leaves you with your gross margin. Then you subtract your operating expenses, leaving you with your operating income. From operating income you subtract any other expense, and your income taxes, which leaves you with your net income.*

What are the three components of the Statement of Cash Flows?

- Cash from Operations
- Cash from Investing
- Cash from Financing
- *The three components of the statement of cash flows are cash from operations, cash from investing and cash from financing.*

What is EBITDA?

- EBITDA stands for Earnings before interest, taxes, depreciation, and amortization and is a good metric to evaluate a company's profitability
- EBITDA=Revenues – Expenses (Excluding tax, interest, depreciation and amortization)
- *EBITDA stands for Earnings Before Interest Taxes Depreciation and Amortization and is an indicator of a company's financial performance. It is a good way of comparing the performance of different companies because it removes the effects of financing and accounting decisions like interest and depreciation. It is also considered a rough estimate of free cash flow.*

What is Enterprise Value?

- Enterprise value is the value of an entire firm, both debt and equity. The equation is below.

$$Enterprise\ Value = Market\ Value\ of\ Equity + Debt + Preferred\ Stock + Minority\ Interest - Cas$$

- *Enterprise value is the value of a firm as a whole, to both debt and equity holders. In order to calculate enterprise value you take the market value of equity (AKA the company's market cap), add the Debt, add the value of the outstanding preferred stock, add the value of any minority interests the company owns and then subtract the cash the company currently holds.*

What are some ways you can value a company?

- Comparable Companies (To calculate either Enterprise Value OR Equity Value)
  - Average multiple from comparable companies (based on size, industry, etc), multiplied by the operating metric of the company you are valuing
  - Most common multiple is Enterprise Value/EBITDA
  - Others include Price/Earnings, EV/EBIT, Price/Book, EV/Sales
  - Different multiples may be more or less important in different industries
  - For example, if a similar company A is trading at an EV/EBITDA multiple of 6x, and the company you are valuing has EBITDA of $100 million, their EV would be valued at $600 million based on this valuation technique.
- Market Valuation
  - The market value of equity is only for publicly traded companies and is calculated by multiplying the number of shares outstanding by the current share price. AKA Market Cap
- Precedent Transactions
  - With this valuation technique you need to find historical transactions that are similar to the transaction in question. This includes the size of the company, the industry they are in, the economic situation, etc. Once you have found a transaction/transactions, look at how that company was valued. What metrics (EBIT, EBITDA, etc) did they use? Calculate a valuation multiple based on the sale price in that transaction, and apply the multiple to the appropriate

metric of the company in question. Most of the time this valuation technique will result in the highest valuation due to the inclusion of the "control premium" that a company will pay for the assumed "synergies" that they hope will occur after the purchase.

- Discounted Cash Flow Analysis
  - o See "Walk me through a DCF" for more information on the discounted cash flow method of valuation
- LBO Valuation
  - o Essentially an LBO (leveraged buyout) is when a firm uses a higher than normal amount of debt to finance the purchase of a company, then uses the cash flows from the company to pay off the debt over the time the firm owns the company. Many times they use the assets of the company being acquired as the collateral for the loan. When they are ready to sell the company, the debt has been paid off, and they can collect all of the profits from the sale as the sole equity owners of the company, producing high returns to the original investors. For more detailed information on LBO's, see the LBO analysis in the advanced section.
- Below is the general answer to this question, but be ready to give the brief description of any of the methodologies as described above if they ask.
- *There are a number of ways to value a company. The most simple would be the market valuation, which is just the equity value of the company and is simply the market cap of the company. You can also use a comparable companies analysis, a precedent transactions analysis a discounted cash flow analysis and sometimes it may be appropriate to use a Leverage Buyout Valuation.*

Which of the valuation methodologies will result in the highest valuation?

Highest
Precedent Transaction
Discounted Cash Flow
Market Comps
Market Valuation
Lowest

- *Of the four main valuation techniques (Market Value, Market Comps, Precedent Transactions and DCF) the highest valuation will normally come from the Precedent Transactions technique because a company will pay a premium for the synergies coming from the merger. A DCF will normally give you the next highest valuation simply because those building the DCF tend to be somewhat optimistic in their assumptions going into their model. Market comps and market value will normally give the lowest valuation.*

Walk me through a Discounted Cash Flow model.

- This is one of the most common questions you may receive in an interview.
- To begin, we need to first project free cash flows for a period of time, usually five to ten years. Free cash flow is equal to EBIT times (1- the tax rate) plus Depreciation and Amortization minus Capital Expenditures minus the Change in Net Working Capital.
- Next we must predict the free cash flows for the years beyond the 5 or 10 we have predicted. To do this we must establish a terminal value, as is detailed above.
- Now that we have established our future cash flows, we must come up with the present value of those cash flows. To do this we must establish an appropriate discount rate. This discount rate is the Weighted Average Cost of Capital, or WACC. The calculation of WACC is discussed below.
- To find the present values of the cash flows (which is equal to the company's enterprise value), we

discount them by the WACC, as follows.

$$Enterprise\ Value = \frac{CF_1}{(1+WACC)^1} + \frac{CF_2}{(1+WACC)^2} + \cdots + \frac{CF_n}{(1+WACC)^n}$$

- The final cash flow will be the sum of the terminal value calculation and the final year's free cash flow
- For a much more in depth description of a Discounted Cash Flow analysis, view the DCF tutorial at Investopedia at http://www.investopedia.com/university/dcf/default.asp.
- *To begin we would project the free cash flows of the company for about 10 years. Free cash flow is EBIT times 1 minus the tax rate, plus Depreciation and Amortization, minus CapEx, minus the Change in Net Working Capital. Then you must predict the free cash flows beyond 10 years which is done either using a terminal value multiple or the using the perpetuity method. To calculate the perpetuity you must establish a terminal growth rate which is usually around the rate of inflation or GDP growth (low single digit percentage). Then multiply the year 10 cash flow by 1 plus the growth rate and divide it by your discount rate minus the growth rate. Now, in order to do this you must have established a discount rate. For a discounted cash flow you use WACC, which is the Weighted Average Cost of Capital as your discount rate, and discount all your cash flows back to year zero using that rate. The sum of the present values of all those cash flows is the value of the firm.*
- Be ready to define WACC if asked. That is described below.

How do you calculate Free Cash Flow?

$$EBIT(1-T) + \ Depreciation\ \&\ Amortization - \Delta NWC - Capital\ Expenditure$$

- *Free cash flow is EBIT (Earnings Before Interest and Taxes) times 1 minus the tax rate plus Depreciation and Amortization minus Capital Expenditures minus the Change in Net Working Capital*

Why do you project out free cash flows for the DCF model?

- *The reason you project FCF for the DCF is because FCF is the amount of actual cash that could hypothetically be paid out to lenders and investors from the earnings of a company.*

What is WACC and how do you calculate it?

- WACC stands for Weighted Average Cost of Capital. It is used as the discount rate in a discounted cash flow analysis to present value the company's cash flows and terminal value and reflects the risk of the company.
- WACC represents the blended cost to both debt holders and equity holders of a firm based on the cost of debt and cost of equity.

$$WACC = \left[\left(\frac{E}{D+E+P}\right)(K_E)\right] + \left[\left(\frac{D}{D+E+P}\right)(1-T)(K_D)\right] + \left[\left(\frac{P}{D+E+P}\right)(K_P)\right]$$

$$E = Equity$$
$$D = Debt$$
$$P = Preffered\ Stock$$
$$K_E = Cost\ of\ Equity$$
$$K_D = Cost\ of\ Debt$$
$$K_P = Cost\ of\ Preferred\ Stock$$
$$T = Corporate\ Tax\ Rate$$

- *WACC is the percentage of equity in the capital structure times the cost of equity (which is calculated using the Capital Assets Pricing Model) plus the percentage of debt in the capital structure times one minus the corporate tax rate times the cost of debt (which is the current yield on their outstanding debt) plus the percentage of preferred stock in their capital structure times the cost of preferred stock (if there is any preferred stock outstanding).*

What is Net Working Capital?

- $Net\ Working\ Capital = Current\ Assets - Current\ Liabilities$
- *Net Working Capital is equal to Current Assets minus Current Liabilities. It is a measure of how able a company is able to pay off its short term liabilities with its short term assets. A positive number means they can cover their short term liabilities with their short term assets. If the number is negative, the company may run into trouble paying off their creditors which could result in bankruptcy.*

What happens to Free Cash Flow is New Working Capital increases?

- *Since you subtract the Change in Net Working Capital in the calculation of Free Cash Flow, if Net Working Capital increases, your Free Cash Flow will decrease.*

What are the components of each of the items on the statement of cash flows?

- Operations:
  - Cash generated from the normal operations of a company
- Investing:
  - Change in cash from activities outside normal scope of the business
  - This may include the purchase of property, plant and equipment, and other investments not reflected on the income statement
- Financing:
  - Cash from changes in liabilities and shareholders' equity including any dividends that were paid out to investors. For example the issuance of any debt or equity, or the repurchase of debt or

equity would be reflected here.

- *Cash flow from operations is the cash generated from the normal operations of a company. The cash flow from investing is the change in cash due to outside occurrences such as the purchase of Property, Plant and Equipment, or any other investments. Cash flow from financing involves the increase or decrease in cash due to the issuance or repurchase/repayment of equity and debt.*

What is the difference between the income statement and statement of cash flows?

- *A company's sales and expenses are recorded on their income statement. The statement of cash flows records what cash is actually being used and where it is being spent by the company during that time period*

What is the link between the Balance Sheet and the Income Statement?

- The profits generated on the income statement after any payment of dividends are added to shareholder's equity on the balance sheet under retained earnings
- Debt on the balance sheet is used to calculate interest expense on the income statement
- Property, Plant and Equipment on the balance sheet is used to calculate depreciation expense on the income statement
- *There are many links between the balance sheet and the income statement. The major link is that any net income from the income statement, after the payment of any dividends, is added to retained earnings. In addition, debt on the balance sheet is used to calculate the interest expense on the income statement, and property plant and equipment will be used to calculate any depreciation expense.*

What is the link between the Balance Sheet and the Statement of Cash flows?

- Beginning cash on cash flow comes from the balance sheet
- Cash from operations is calculated from changes in balance sheet accounts AKA Net Working Capital (Current Assets-Current Liabilities)
- Depreciation comes from Property, Plant & Equipment on the balance sheet
- Investments in PP&E come from the balance sheet and are accounted for under cash flow from investing
- Ending cash goes back onto the balance sheet
- *Well, the beginning cash on the statement of cash flows comes from the previous period's balance sheet. The cash from operations is impacted by the change in net working capital which is Current Assets minus Current Liabilities. Depreciation comes from property, plant and equipment which affects cash from operations. Any change in property, plant and equipment due to the purchase or sale of that equipment will affect cash from investing. Finally, ending cash balance from the cash flow statement is the cash balance on the new balance sheet.*

Why do you subtract cash from Enterprise Value?

- *The reason for subtracting cash from Enterprise Value is two-fold. First off, cash is already accounted for within the market value of equity, and in addition, cash is considered a non-operating asset.*

Why might there be multiple valuations of a single company?

- *The different methods of valuation will each give a different valuation of a given company. Generally, the precedent methodology will give a higher valuation than the comparable companies analysis because when a company is purchased, the purchaser will usually pay some sort of a "control* *premium" over the company's market value to entice shareholders to sell, and to account for the "synergies" that may occur when the two companies become one. The DCF will also normally produce a higher valuation than the comparable companies due to the fact that when one makes their projections and assumptions for a company's future cash flows, they are usually somewhat optimistic. The reason for these differences is due to different assumptions, different multiples, or different comparable companies and/or transactions.*

How do you determine which of the valuation methodologies to use?

- *The best way to determine the value of a company is to use a combination of all the methodologies and zero in on an appropriate valuation. If you have a precedent transaction you feel is extremely accurate, you can give that more weight, if you are extremely confident in your DCF you can give that more weight. Valuing a company is as much an art as it is a science.*

How do you calculate a firm's terminal value?

$$Terminal\ Value = \frac{FCF_{10}(1+g)}{(WACC-g)}$$

- *There are two ways to calculate terminal value. The first is the terminal multiple method. To use this method, you choose an operation metric (most common is EBITDA) and apply a comparable company's multiple to that number from the final year of projections. The second method is the perpetuity growth method. To use this method you choose a modest growth rate, usually just a bit higher than the inflation rate or GDP growth rate, in order to assume that the company can grow at this rate infinitely. We then multiply the FCF from the final year by 1 plus the growth rate, and divide that number by the discount rate (WACC) minus the assumed growth rate.*

Intermediate

What is the Capital Assets Pricing Model?

- Used to calculate the required/expected return on investment (ROE), or the Cost of Equity of a company
- $Re = Rf + B(Rm - Rf)$
- *The Capital Assets Pricing Model is used to calculate the required return on equity or the cost of equity. The return on equity is equal to the risk free rate (which is usually the yield on a 10-year US government bond) plus the company's beta (which is a measure of how volatile the stock is in relation to the stock market) times the market risk premium.*

What is Beta?

- Represents relative volatility or correlation of the given investment with respect to the market
- $\beta < 1$ means less volatile than market (Pharmaceutical Company)
- $\beta > 1$ means more volatile than market (electronics / websites)
- A beta of 1.2 means that an investment will theoretically be 20% more volatile than the market. If the market goes up 10%, that investment should go up 12%.
- *Beta is a measure of the volatility of an investment compared with the market as a whole. The market has a beta of 1, while investments that are more volatile than the market have a beta greater than 1 and those that are less volatile have a beta of less than 1.*

How would a $10 increase in depreciation expense affect the three financial statements?

- Break this question down into pieces. The easiest way is to start with the income statement. A $10 increase in depreciation is an expense, which therefore lowers your operating profit by $10 and you will pay less taxes. Your taxes will decrease by ($10 x T) and therefore your net income will decrease by ($10 x (1-T)). Assuming a 40% tax rate, the drop in net income will be $6.
- This will flow from the income statement to the statement of cash flows, reducing cash from operations by $6. However, the depreciation is a non-cash item so it will increase cash from operations by $10 since you add back depreciation. Ending cash is therefore increased by $4.
- This cash flows to the balance sheet, increasing cash by $4 while reducing PP&E by $10. Overall assets fall by $6. This needs to balance with the other side of the balance sheet. In order to balance the balance sheet, retained earnings will fall by $6 due to the drop in Net Income.
- *Let's start with the income statement. The $10 increase in depreciation will be an expense, and will therefore reduce net income by $10 times (1-T). Assuming a 40% tax rate, this will mean a reduction in net income of $6. This will flow to cash from operations where net income will be reduced by $6, but depreciation increases by $10, resulting in an increase of ending cash by $4. Cash then flows onto the balance sheet. Where cash increases by $4, PP&E decreases by $10, and retained earnings decreases by $6, causing everything to balance.*

How would you calculate the discount rate for an all equity firm?

- *If a firm is all equity, then you would use CAPM to calculate the cost of equity, and that would be the discount rate.*

What is the market risk premium?

- *The market risk premium is the required return that investors require for investing in stocks over investing in "risk free" securities. It is calculated as the average return on the market (approx 12.6%)- the risk free rate (yield on a 10 year treasury)*

What kind of an investment would have a negative beta?

- *Gold is a type of investment that would have a negative beta. When the stock market goes up, the price of gold drops as people flee from the "safe haven" of gold. The opposite happens when the market goes down, implying a negative correlation.*

How much would you pay for a company with $50 million in revenue and $5 million in profit?

- To value this company, you must use multiples or a precedent transactions analysis. For more information about these types of valuation techniques, refer to the "how would you value a company" question above.

How would you value a company with no revenue?

- *In order to value a company with no revenue, such as a start up, you must project the company's cash flows for future years and then do a discounted cash flow model of those cash flows using an appropriate discount rate.*

What is the difference between APV and WACC?

- WACC incorporates effect of interest tax shields into the discount rate
  - Typically calculated from actual data from balance sheets and used for a company with a consistent capital structure over the period of the valuation.
- APV adds present value of financing effects to NPV assuming all-equity value
  - Useful where costs of financing are complex and if capital structure is changing
  - Use for Leveraged Buyouts

Describe a company's typical capital structure.

- *A company's capital structure is made up of debt and equity, but there are different levels of each. Debt can be broken down into senior, mezzanine and subordinated, with senior being paid off first in the event of bankruptcy, then mezzanine, then subordinated. Since senior is paid off first, it will have a lower interest rate. Equity can also be broken down into preferred stock and common stock. Preferred stock is like a combination of debt and equity in that it has the opportunity for some appreciation in value, but more importantly pays out a consistent dividend, that is not tied to the market price of the stock. Common stock is the final piece of the capital structure, and is the stock that is traded on the exchanges. In the event of bankruptcy, the common stockholders will have the last right to assets in the event of liquidation, and therefore are bearing the highest level of risk. Due to this they will demand the highest return on their investment.*

When should a company issue stock rather than debt to fund its operations?

- *There are a number of reasons a company may issue stock rather than debt to fund its operations. First, if it believes its stock price is inflated, it can issue stock and receive a high price for the shares. If the projects for which the money is being raised may not generate predictable cash flows in the immediate future, the company may have a difficult time paying the consistent coupon payments required by the issuance of debt. The company could also choose to issue stock if they want to adjust the debt/equity ratio of their capital structure.*

When should an investor buy preferred stock?

- *An investor should buy preferred who wants the upside of potential of equity, but wants to limit risk in the form of a dividend. The investor would receive steady interest-like payments (dividends) that are more secure than the dividends from common stock. Preferred Stock owners also get a superior right to the company's assets should the company go bankrupt (although less rights than debtholders).*

Why would a company distribute its earnings through dividends to common stockholders?

- *The distribution of a dividend signals to the public that a company is healthy and profitable and it can also attract more investors, potentially driving up the company's stock price.*

What is operating leverage?

- Operating leverage is the percentage of costs that are fixed versus variable.
- A company whose costs are mostly fixed is considered to have a high level of operating leverage.
- *Operating leverage is the relationship between a company's fixed and variable costs. A company whose costs are mostly fixed is considered to have a high level of operating leverage.*

How would a $10 increase in depreciation in year 4 affect the DCF valuation of a company?

- *A $10 increase in depreciation decreases EBIT by $10, therefore reducing EBIT(1-T) by $10(1-T). Assuming a 40% tax rate, it drops EBIT(1-T) by $6, but you must add back the $10 depreciation in the calculation of Free Cash Flow. Therefore your FCF increases by $4 and your valuation will increase by the present value of that $4, the equation for PV is below.*

$$PV\ of\ the\ \$4\ increase\ in\ year\ 4 = \frac{\$4}{(1+WACC)^4}$$

Advanced

How/why do you lever/unlever Beta?

$$\beta_{unlevered} = \frac{\beta_{levered}}{[1+(1-T)\left(\frac{Debt}{Equity}\right)]} \qquad \beta_{levered} = \beta_{unlevered}[1+\left((1-T)\left(\frac{Debt}{Equity}\right)\right)]$$

- The levered beta will be the beta you get from a website like yahoo finance.
- *By unlevering the beta, you are removing the financial effects from leverage (debt in the capital structure). This unlevered beta shows you how much risk a firm's equity has compared to the market. Comparing unlevered betas allows an investor to see how much risk they will be taking by investing in a company's equity. When you have a company that doesn't have a beta, you find a comparable company, take their levered beta, unlever it, and then relever it using the new company's capital structure to come up with their beta.*

How would you calculate an equity beta?

- *In order to calculate an equity beta you must perform a regression of the return of the stock versus the return of the market as a whole (the S&P 500). The slope of the regression line is the beta.*

Stocks

Basic

Name three stocks/companies that you think are undervalued and why?

- This question is unique to you. Do some research and find a few stocks that you believe are good buys at their current market price. Have a good reason behind each of your picks. The best way to find these stocks are to use equity research reports if you have access to them. If not, you can use sites like Jim Cramer's thestreet.com, or motleyfool.com to look at articles and their stock picks and reasons behind them. Generally, you are better off picking a less known company so your interviewer doesn't have to opportunity to cross-examine you on your reasoning if they know the stock well. You could go through the process of valuing them yourself using any of the valuation techniques if you are feeling ambitions.

What did the S&P 500/Dow Jones Industrial Average/Nasdaq close at yesterday?

- This is a question used to gauge your general interest in the financial markets. You probably will not be expected to know the number to the penny, but knowing the levels of the three major exchanges, as well as if they were up or down and why they were up or down will show your interviewer that you keep track of what is going on in the world.
- *Yesterday the XXXX closed at XXXX, up/down XXX from the open. I also noticed that it was up XXX on the day before I came into my interviews due to _____.*

Is 15 a high P/E ratio?

- This is not a yes or no question. A firm's P/E ratio is important compared to other companies within their industry. A high P/E represents high anticipated growth in earnings. In high growth industries, such as technology, a P/E ratio of 15 may be considered relatively low, since the company is expected to grow their earnings at a high rate, and will therefore have a higher valuation and a higher P/E. For a large pharmaceutical company, a P/E of 15 may be considered high, since their growth is expected to be relatively low, with stable earnings.
- *It depends on the industry of the company you are looking at. A P/E ratio of 15 in an industry like basic materials is a bit high, but if this company is a high growth tech company, 15 may be considered rather low.*

Company XYZ released increased quarterly earnings yesterday, but their stock price still dropped, why?

- *There are two main reasons that this could occur. First, the entire market could have been down on the day (or the industry to which XYZ belongs), which had more of an impact than the company's positive earnings. More likely however, is that even though they released increased earnings, they were not as high as the Wall Street analysts were predicting they would be.*

Intermediate

Where do you think the stock market will be in 3/6/12 months?

- This is another question that you can use to show your interest in the markets. It is not a right or wrong question; everyone has different opinions on where the market is going. You need to have an opinion and a well thought out reasoning for that opinion. If you think the market is going to drop in the next three months, hit a bottom and then begin to bounce back, *have a reason* why you think it is going to drop, why it is going to bottom out, and why it will begin to rise. It is more important your reasoning makes sense than you are "correct" since nobody knows for sure.

Can you tell me about a recent IPO you have followed?

- Again, this is a question you need to do some research for around the time of your interview. You can find an IPO which is written about in the Wall Street Journal or Financial Times. Another option is to go to dealbook.blogs.nytimes.com and click on the IPO/Offerings tab to see what recent IPOs have occurred. Know the company that went public, a little information about the company, what the offer price was, which banks completed the IPO, etc.

If you read that a given mutual fund has achieved 50% returns last year, would you invest in it?

- *You should do more research because past performance is not an indicator of future results. A mutual fund full of Mortgage Backed Securities could have been up 50% a few years ago and then been down 90% last year due to the market for MBS's collapsing. To make an investment decision you need to research more in depth into the fund's holdings.*

If a company's stock has gone up 20% in the last 12 months, is the company's stock in fact doing well?

- *This depends on a number of different factors including the beta of the company and the performance of the market. If the stock's beta is 1 (meaning it should be as volatile as the market and therefore produce market returns) and the market was up 30% over the past 12 months, then the stock is doing relatively poorly.*

What is insider trading and why is it illegal?

- *Insider trading is the action of buying or selling stock in a company based on information that is not publicly available. For example, if a CEO of a pharmaceutical company knows that a drug is going to be pulled from the shelves by the FDA, he cannot sell his stock until that information is available to the public.*

Who is a more senior creditor, a bondholder or stockholder?

- *A bondholder is always a more senior creditor than a stockholder since in the event of bankruptcy/liquidation the bondholder will be paid first. In addition, interest payments are paid to bondholders before equity holders receive any profits in the form of dividends.*

How can a company raise its stock price?

- A company could repurchase stock, which lowers the number of shares outstanding, raises its EPS and probably its stock price, as well as sends a positive signal to the market.
- They could announce a change to their organizational structure such as cost-cutting or consolidation.
- They could also announce an accretive merger or an acquisition that will increase their earnings per share.
- *Any type of positive news about the company could potentially raise its stock price. If the company repurchases stock, it lowers the shares outstanding and therefore raises the EPS and stock price, it also sends a positive signal to the marker. They could also announce a change to their organizational structure like cost-cuts or consolidations. They could also announce an accretive merger or acquisition that will increase their earnings per share. Any of these occurrences would most likely raise the company's stock price.*

What is correlation?

- Correlation is how two stocks will move in relation to each other
- If two stocks have a strong positive correlation, when one moves up the other should move up as well and vice versa
- If two stocks have a strong negative correlation, when one moves up, the other should move down and vice versa
- Correlation ranges between -1 and 1
- *Correlation is the way that two investments move in relation to one another. If two investments have a strong positive correlation, they will have a correlation near 1 and when one goes up, the other will go up. When you have two with a strong negative correlation, they will have a correlation near -1 and when one investment moves up in value, the other should move down.*

What is diversification?

- Diversification is mixing a wide variety of investments in your portfolio. The goal being a higher return with a lower risk than investing in one single investment.
- To diversify your portfolio you want to pick investments that have a low correlation so that when economic conditions push one investment to have a good period, the other will be having its down period and vice versa.
- Systematic risk is the risk that affects the entire market while unsystematic risk affects only specific industries. If properly diversified, an investor can essentially eliminate all unsystematic risk from their portfolio.
- *Diversification is the process of creating a portfolio of different types of investments. It means investing in stocks, bonds, alternative investments etc. It also means investing across different industries. If an investor is properly diversified, they can essentially eliminate all unsystematic risk from their portfolio, meaning that they can limit the risk associated with one individual stock and their portfolio will only be affected by factors affecting the entire market.*

If you add a risky stock to a portfolio, what happens to the overall risk of your portfolio?

- *It depends on the correlation of the new investment to the portfolio. It could potentially lower the overall risk of the portfolio.*

What is the difference between technical analysis and fundamental analysis?

- *Technical analysis is the process of picking stocks based on historical trends and stock movements mainly based on charts. Fundamental analysis is examining a company's fundamentals, financial statements, industry, etc and picking stocks that are "undervalued."*

A stock is trading at $5 and a stock is trading at $50, which has greater growth potential?

- *It depends. The stock with the higher growth potential is most likely the stock with the lower market cap, so if the $5 stock has 1billion shares outstanding and the $50 stock has 10,000 shares outstanding, the $50 stock would actually most likely have higher growth potential.*

Advanced

What do you think is going on with XYZ company/industry?

- This is a question to gauge your general interest in the financial markets. You cannot prepare for this question in any other way than to keep up with reading the Wall Street Journal or watching CNBC. Chances are they would ask you about a company or industry that has been in the news recently, or something that you have shown interest in on your resume, rather than a completely arbitrary company or industry.

When should a company buy back stock?

- *A company will buy back its own stock for a number of reasons. When it believes the stock is undervalued, when it has extra cash, when it believes it can make money by investing in itself, or when it wants to increase its stock price by increasing its EPS due to a reduction in shares outstanding or send a positive signal to the market.*

Why do some stocks rise so much on the first day of trading after their IPO and others don't? How is that money left on the table?

- *Money left on the table means the company could have completed the offering at a higher price, and that difference in valuation goes to the initial investors in the stock, rather than the company raising the money. This means the company could have sold the same stock in its IPO at a higher price than it actually offered it at. This happened a lot during the .com boom. Company's stock would skyrocket on the first day of trading due to the huge hype over the stock.*

Bonds and Interest Rates

Basic

What is the default premium?

- *The default premium is the difference between the yield on a corporate bond and the yield on a government bond with the same time to maturity to compensate the investor for the default risk of the corporation, compared with the "risk-freeness" of the comparable government security.*

What is the default risk?

- *The default risk is the risk of a given company going bankrupt.*

What is "face value"?

- *Face value or par value of a bond is the amount the bond issuer must pay back at the time of maturity. Bonds are usually issued with a $1,000 face value.*

What is the coupon payment?

- *The coupon payment is the amount that a company will pay to a bondholder normally on an annual or semi-annual basis. It is the coupon rate x the face value of the bond. For example, the coupon payment on an annual 10% bond with a $1,000 face value is $100.*

What is the difference between and investment grade bond and a "junk bond"?

- An investment grade bond is one that has a good credit rating, a low risk of bankruptcy and therefore pays a low interest rate.
- A "junk bond" is a bond that has a poor credit rating and a relatively high risk of bankruptcy and is therefore required to pay investors a higher interest rate.
- *An investment grade bond is a bond issued by a company that has a relatively low risk of bankruptcy and therefore has a low interest payment. A "junk bond" is one issues by a company that has a high risk of bankruptcy but is paying high interest payments.*

How do you price a bond?

$$Price = \sum_{t=1}^{T} \frac{Coupon_t}{(1+r)^t} + \frac{Par\ Value}{(1+r)^t}$$

- *The price of a bond is the net present value of all future cash flows (coupon payments and par value) expected from the bond using the current interest rate.*

If the price of a bond goes up, what happens to the yield?

- *The price and yield of a bond move inversely to one another. Therefore, when the price of a bond goes up the yield goes down.*

How do you determine the discount rate on a bond?

- *The discount rate is determined by the company's default risk. Some of the factors that influence the discount rate include a company's credit rating, the volatility of their cash flows, the interest rate on comparable U.S. Bonds, and the amount of current debt outstanding.*

What is the current yield on the 10-year Treasury note?

- This information changes daily and is available in the Wall Street Journal or any financial website.

If the price of the 10-year Treasury note rises, what happens to the notes yield?

- *The price and yield are inversely related, so when the price goes up, the yield goes down.*

What would cause the price of a treasure note to rise?

- *If the stock market is extremely volatile, and investors are fearful of losing money, they will desire risk free securities, which are government bonds. The increase in demand for these securities will drive the price up, and therefore the yield will fall.*

If you believe interest rates will fall, should you buy bonds or sell bonds?

- *If interest rates fall, bonds prices will rise, so you should buy bonds.*

How many basis points equal 0.5 percent?

- One basis point = .01 percent. Therefore 0.5 percent = 50 basis points
- *Since one basis point is equal to one-hundredth of a percent, one-half of a percent is equal to fifty basis points.*

<u>Intermediate</u>

What is the yield to maturity on a bond?

- The yield to maturity is the rate of return anticipated on a bond if it is held through its maturity date.
- Normally, the yield to maturity is expressed at an annual rate.
- The calculation of YTM includes the current market price, the par value, the coupon payments and the time to maturity. In calculating YTM you also assume that the coupon payments are reinvested at the same rate.
- If the coupon yield of a bond (coupon/face) is lower than its current yield (coupon/price) it is selling at a discount.
- If the coupon yield of a bond (coupon/face) is higher than its current yield (coupon/price) it is selling at a premium.
- *The yield to maturity on a bond is the rate of return on a bond if it is held through its maturity date based on its current price, coupon payments, face value and maturity date.*

What will happen to the price of a bond if the fed raises interest rates?

- *If interest rates rise, newly issued bonds offer higher yields to keep pace. Therefore, existing bonds with lower coupon payments are less attractive, and the price must fall to raise the yield to match the new bonds.*

How would you value a perpetual bond that pays a $1,000 coupon per year?

$$Value\ of\ Perpetual\ Bond = \frac{Coupon\ Payment}{Current\ Interest\ Rate\ on\ Comparable\ Bonds}$$

- *Well, a perpetual bond is one that pays a coupon payment every year for eternity, with no repayment of principal (par value). If it is a perpetual bond, then the value of the bond will be coupon payment divided by the current interest rate.*

When should a company issue debt instead of issuing equity?

- *A company will normally prefer to issue debt since it is cheaper than issuing equity. In addition, interest payments are tax deductible and therefore provide interest tax shields. However, a company needs to have a steady cash flow in order to be able to pay the coupon payments every year, whereas that is not necessary when issuing equity. It may also try to raise debt if it feels its stock is particularly undervalued and would not raise the capital needed from an equity offering.*

If you believe interest rates will fall, which should you buy: a 10-year coupon bond or a 10-year zero coupon bond?

- *Since a zero-coupon bond is more sensitive to fluctuations in interest rates, when the interest rates fall, the price of the zero-coupon bond will rise more than the price of the coupon bond. Therefore, if they believe interest rates will fall, they should purchase the zero-coupon bond.*

Which is riskier: a 30 year coupon bond or a 30 year zero coupon bond?

- A zero coupon bond is riskier since you will receive no payments until the final redemption date, whereas on a coupon bond you will receive payments over the life of the bond.
- The price of a zero-coupon bond is also more sensitive to interest rate fluctuations, increasing its level of risk.
- *Since a zero coupon bond will yield $0 until its date of maturity, while a coupon bond will pay out some cash every year, which in turn makes the coupon bond less risky since even if the company defaults on its debt prior to its maturity date, you will have received some payments with the coupon bond.*

Why can inflation hurt creditors?

- Inflation cuts into the percentage that creditors make when they lend out money at a fixed rate.
- For example, if a bank lends at 7%, expecting 2% inflation, they expect to make a 5% gain. However, if inflation increases to 4%, they are only making 3% on their lending.
- *Inflation can definitely hurt creditors. Creditors assign their interest rates based on the risk of default as well as the expected inflation rate. If a creditor lends at 7% and inflation is expected at 2% they are expecting to make 5%. But if inflation actually increases to 4%, they are only making 3%.*

How would you value a zero-coupon perpetual bond?

- This is a trick question. A perpetual bond has no maturity date and is not redeemable; therefore it pays only coupon payments. If it pays only coupon payments, and the coupon is zero, than it actually pays nothing, and has no value.
- *Since a zero coupon bond doesn't have any interest payments, and a perpetual bond has no par value, the value of the bond is zero since it will pay out nothing.*

If the stock market falls, what would you expect to happen to bond prices and interest rates?

- *When the stock market falls, investors flee to safer securities, like bonds, which causes the demand for those securities to rise and therefore the price as well. Since prices and yields move inversely, if bond prices rise, yields will fall. The government may lower interest rates in an attempt to stimulate the economy.*

What are some ways to determine if a company poses a credit risk?

- The easiest way to determine a company's credit risk is to look at their credit rating which is provided both Standard & Poors and Moody's.
- If one wanted to perform their own analysis, some metrics to look at would be the Current Ratio (Current Assets / Current Liabilities) and the Quick Ratio [(Cash + Marketable Securities + Receivables)/Current Liabilities] and compare these ratios to the industry averages.
- One can also look at longer term measures like the long term debt ratio, debt/equity and interest coverage ratio (EBIT/Interest Expense) which shows the company's ability to pay its interest expense with its earnings and again compare these to industry averages.
- *Determining the credit risk of a company takes an incredible amount of work and research. However, some quick things to look at would be their credit ratings from Moody's or Standard and Poor's, their current ratio, their quick ratio, their debt to equity ratio, and their interest coverage ratio.*

Why is a firm's credit rating important?

- *The lower a firm's credit rating, the higher its risk of bankruptcy and therefore the higher its cost of borrowing.*

What is a callable bond, and why would a company issue one?

- *A callable bond is a bond which the company has the right to repurchase at any time in the future for the par value of the bond. A company will issue a callable bond if they believe interest rates may fall in the future, so they would have the option of repurchasing the higher interest rate bonds, and reissuing bonds at a lower interest rate. Since the bond being callable is a negative to an investor, they will get a discount on their bonds if they are callable.*

Advanced

What steps can the Fed take to influence the economy?

- Open Market Operations
  - Open market operations are the fed buying and selling securities (government bonds) to change the monetary supply. Buying government securities increases the money supply and stimulates expansion, selling securities shrinks the money supply and slows the economy.
- Raise or lower interest rates
  - The discount rate is the interest rate The Fed charges banks on short-term loans.
  - The federal funds rate is the rate banks charge each other on short-term loans.
  - When The Fed lowers these rates, it signals an expansionary monetary policy.
- Manipulate the reserve requirements
  - The reserve requirement is the amount of cash a bank must keep on hand to cover its deposits (money not loaned out). When this requirement is lowered, more cash is loaned out and is pumped into the economy, and is therefore expansionary policy.

What does X-economic event effect inflation/interest rates/bond prices?

- Below is a chart of economic events and their impacts.

Economic Event	Inflation	Interest Rates	Bond Prices
Unemployment figures low	Up	Up	Down
Dollar weakens against Yen	Up	Up	Down
Consumer confidence low	Down	Down	Up
Stock market drops	Down	Down	Up
Companies report healthy earnings	Up	Up	Down

- Below is a chart of economic indicators and what is considered a positive/negative event.

Indicator	Positive Economic Event	Negative Economic Event
GDP	Up	Down
Unemployment	Down	Up
Inflation	Down	Up
Consumer Price Index	Down	Up
Interest Rate	Down	Up
New Home Sales	Up	Down
Existing Home Sales	Up	Down

How would the follow scenario affect the interest rates: the president is impeached and convicted?

- Any negative news about the country as a whole will lead to fears that the economy may decline, so the Fed would most likely lower interest rates to stimulate economic expansion.

What is duration?

- Duration is a measure of the sensitivity of the price of a bond to a change in interest rates. Duration is expressed as a number of years. When interest rates rise, bond prices fall, and falling interest rates mean rising bond prices. Formally, it is the "weighted average maturity of cash flows". In simple terms, it is the price sensitivity to changes in interest rates. If your cash flows occur faster or sooner your duration is lower and vice versa. In other words, a 4 year bond with semi-annual coupons will have a lower duration than a 10 year zero-coupon bond. The larger the duration number, the greater the impact of interest-rate fluctuations on bond prices.

What does the government do when there is a fear of hyperinflation?

- The government can do a number of things to slow the economy and defuse hyperinflation. They can use taxation and government spending to regulate the level of economic activity.
    - Increasing taxes and decreasing government spending slows down growth in the economy and fights inflation.
    - Additionally, raising key interest rates will slow the economy; reduce the money supply and slow inflation.

Let's say a report release today showed that inflation last month was very low. However, bond prices closed lower. Why might this happen?

- *This would occur because bond prices are based on expectations of future inflation. Bond traders would expect future inflation to be higher, and therefore the demand for bonds today will be lower, increasing the yields to match the increased inflation.*

Currencies

Basic

What is the spot exchange rate?

- *The spot exchange rate is the rate of a foreign-exchange contract for immediate delivery. Spot rates are the price that a buyer will pay for a foreign currency.*

What is the forward exchange rate?

- The forward rate is the price at which currencies can be exchanged at some given date in the future.
- The forward rate is used by speculators as well as companies looking to hedge their foreign exchange risk.
- *The forward exchange rate is the price that a foreign currency will cost at some time in the future. A company can enter into a forward contract on exchange rates to help hedge against exchange rate fluctuations in the future.*

What factors affect foreign exchange rates?

- Interest Rates
- Inflation
- Capital market equilibrium

What is the difference between a "strong" and a "weak" currency?

- *A strong currency is one whose value is rising. A weak currency is one whose value is falling*

Intermediate

How is the market exchange rate between two country's currencies determined?

- The interest rates in the two countries
    - If the interest rate of a foreign country relative to the home country goes up, the home currency weakens
    - When interest rates in a country rise, investments held in that country's currency will earn a higher rate of return and the demand for that country's currency will rise because people will want to invest in that country. The rise in demand will cause the currency to strengthen.
- Also the rates of inflation in the two countries will affect the exchange rate. If inflation in Country A is expected to be higher than in Country B, Country A's currency will be devalued and will be worth less.
- *The exchange rate between two country's currencies is determined by a few factors. First is the interest rates in the two countries. If the interest rate in the home country increases relative to the foreign country, the demand for the home country's currency increases and therefore the home currency strengthens. Also impacting the exchange rate is the expected inflation rates in the two countries.*

If the U.S. dollar weakens, should interest rates generally rise, fall, or stay the same?

- Generally speaking, when the US dollar weakens, the interest rates in the US will rise.
- A weak dollar means the price of imported good will rise, which means higher inflation. Higher inflation will raise interest rates.
- *Most times, when the US Dollar weakens, the price of imported goods will rise which causes higher inflation, which in turn will cause a rise in interest rates.*

If inflation rates in Country A fall relative to Country B, what happens to the exchange rate?

- The currency of Country A will strengthen compared to Country B.
- *If a county's inflation rate is expected to fall relative to another, that country's currency will strengthen since there will be relatively less of that currency in circulation and demand will be higher.*

Advanced

Below is a chart which explains the effect of changes in the exchange rate on the earnings of US Multinational companies.

Economic Event	Effect on Earnings of U.S. Multinational Companies
U.S. Dollar Strengthens	Negative
U.S. Dollar Weakens	Positive

Below is a chart of the effects of changes in interest rates and inflation rates on the exchange rate of the US Dollar.

Economic Event	Effect on Dollar
U.S. Interest Rates Rise	Strengthens
U.S. Inflation Rates Rise	Weakens

What is the difference between currency devaluation and currency depreciation?

- *Currency devaluation occurs in a fixed-exchange rate system like China, when the government changes the exchange rate of its currency. Currency depreciation occurs when a country allows its currency to move according with the currency exchange market, and the country's currency loses value.*

If the spot exchange rate of dollars to pounds is \$1.60/£1 and the one-year forward rate is \$1.50/£1, would we say the dollar is forecast to be strong or weak relative to the pound?

- When the spot exchange rate is higher than the forward exchange rate, the dollar is expected to strengthen relative to the pound in the coming year.
- *Since 1 pound costs more dollars now than it will in the future, the dollar is therefore expected to strengthen in the next year.*

Options and Derivatives

Basic

What is a derivative?

- *A derivative is a type of investment that derives its value from the value of other assets like stocks, bonds, commodity prices or market index values. Some derivates are futures contracts, forwards contracts, calls, puts, etc.*

What is hedging?

- Hedging is a financial strategy designed to reduce risk by balancing a position in the market. For example, an investor that owns a stock could hedge the risk of the stock going down by buying put options on that security or other related businesses in the industry.

What are options?

  - Call Option: Gives the holder the right to purchase an asset for a specified exercise price on or before a specified expiration date.
  - Put Option: Gives the holder the right to sell an asset for a specified exercise price on or before a specified expiration date.

- *Options are a type of derivative that gives the bearer the "option" to buy or sell a security at a given date, without the obligation to do so. The buyer of the option pays an amount less of the actual value of the stock and has the OPTION to buy or sell the stock for a set price on or before a set date.*

What are forwards contracts?

- Forwards are an agreement that calls for future delivery of an asset at an agreed-upon price.
- No money is changed originally. They are designed to protect each party from future price fluctuations.
- *A forward contract is a type of derivative that arranges for the future delivery of an asset (oil, grain, currencies, etc) on a specific date at a specific price.*

What are futures contracts?

- *Futures are a financial contract obligating the buyer to purchase an asset like a commodity or another financial instrument at a specified price on a specified date. Futures are very strictly defined in their terms and are traded publicly on exchanges.*

What is the main difference between futures contracts and forward contracts?

- There are a few slight differences between futures and forwards.
- Futures are traded on exchanges and forwards are traded over-the-counter.
- Futures are highly standardized, which allows them to be traded on exchanges.
- Forwards are privately negotiated and can be customized and can also be changed after the contract has been agreed upon, as long as both parties agree.

- *Futures are very strict in their terms and are traded publicly on exchanges, while forwards are privately negotiated contracts and can be arranged to basically any specifications that the buyer and seller agree upon.*

Below is a chart of what actions an investor would want to take depending on their belief of what a security will do in the future.

Investor Expectation	**Action to take**
Person believes a stock will go up	Buy a call
	Write a put
Person believes a stock will go down	Buy a put
	Write a call

Intermediate

What factors influence the price of an option?

- Factors include current stock price, exercise price, the volatility of the stock, time to expiration, interest rate and the dividend rate of the stock.
- Below is a chart of how these factors influence the price of an option.

If this variable increases	**The value of a call option**
Stock price	Increases
Exercise price	Decreases
Volatility	Increases
Time to expiration	Increases
Interest rate	Increases
Dividend payouts	Decreases

If an option is "in the money" what does that mean?

- An option is "in the money" when the exercising of the option will result in a profit.
- A call option is in the money when its exercise price is below the market price since an investor can purchase the asset at the exercise price and instantly sell it at the market price.
- A put option is in the money when its exercise price is above the market price since an investor can buy the asset at the market price and instantly sell it at the exercise price.
- *If an option is "in the money" it means that at this point in time, if an investor decides to exercise their option, they will be making money on the purchase of the option.*

What are swaps?

- Swaps are an exchange of future cash flows. This can be a swap of interest rates, currency exchange rates, etc.
- Swaps can benefit both companies if one has access to a lower floating rate, and one has access to a lower fixed rate, and each desires the rate the other company has access to.
- *Basically a swap is an agreement to exchange future cash flows. The most prominent "swap" lately have been the credit default swaps issued by banks as a type of insurance against companies not being able to pay back their debt.*

Say I hold a put option on Microsoft stock with an exercise price of $60, the expiration date is today, and Microsoft is trading at $50. About how much is my put worth and why?

- *This put is worth $10. This is due to the fact that the put gives you the option to sell the shares at $60, and you can currently buy them in the open market at $50. You can buy them at $50, instantaneously them for $60, therefore making a profit of $10 per share.*

<u>Advanced</u>

All else being equal, which would be less valuable: a December put option on Apple stock or a December put option on Pfizer stock?

- *The put option on Pfizer stock would be less valuable due to the fact that Pfizer is less volatile. The more volatile the underlying asset, the more valuable the option on the stock.*

All else being equal, which would be more valuable: a December call option for Apple or a January call option for Apple?

- *The January option would be more valuable since the later an option's expiration date, the more valuable the option.*

Why do interest rates matter when figuring the price of options?

- *Interest rates matter due to net present value. Higher interest rates lower the value of options since the PV of that option will be lower.*

Mergers and Acquisitions

Basic

What are some reasons that two companies would want to merge?

- Synergies
- New market presence
- Consolidate operations
- Gain brand recognition
- Grow in size
- Gain patents, plants, equipment, intellectual property
- *The main reason that two companies would want to merge would ideally be the synergies that the companies will gain by combining their operations. However, some other reasons would be gaining a new market presence, an effort to consolidate their operations, gain brand recognition, grow in size, or to potentially gain the rights to some property (physical or intellectual) that they couldn't gain as quickly by creating or building it on their own.*

What are some reasons two companies would not want to merge?

- The "synergies" they are looking to gain through the merger simply will not occur.
- Many times, mergers are more about boosting a management team's ego and growing the business in order to gain the marketability and media attention of a merger.
- HUGE investment banking fees associated with going through a merger.
- *A lot of times the synergies that a company hopes to gain by going through with a merger will not actually occur. Also, many times a company may be looking to go through with a merger due to management ego and them wanting to gain media attention. Finally, the investment banking fees associated with completing a merger are enormous and in some cases prohibitive.*

What is the difference between a strategic buyer and a financial buyer?

- Strategic buyer: A corporation that wants to acquire another company for strategic business reasons such as synergies, growth potential, etc.
- Financial buyer: A group looking to acquire another company purely as a financial investment. This would be something like a private equity fund doing a leveraged buyout of the company.
- *Strategic buyers and financial buyers are very different. A strategic buyer is a company who is looking to buy another company in order to enhance their business strategically, whether it be through cost cutting, synergies, gaining property, etc. A financial buyer is a group such as a private equity firm who is buying a company purely as an investment, looking to gain the income the company produces.*

Which will normally pay a higher price for a company, a strategic buyer or a financial buyer?

- *A strategic buyer will normally pay a higher price. This is due to the premium which is paid since they are buying it with the intention of lowering costs, improving their existing business, etc. and are therefore willing to pay a premium for those cost savings.*

Intermediate

Can you name two companies that you think should merge?

- Another question testing your awareness of what is going on in the markets. No right or wrong answer to this question, just have two companies you believe would benefit from merging, and have a well formulated reason behind the merger (think synergies, gain foothold in a new market, consolidation of operations, or brand recognition).
- The important part of your answer to this question is that the two companies would make sense coming together, and you have a solid reason for why it would make sense.

What is a stock swap?

- A stock swap is when the acquired company agrees to be paid in stock of the new company because they believe in the potential for success in the merger.
- Stock swaps are more likely to occur when the stock market is performing well and the stock price of the acquiring firm is relatively high, giving them something of high value to purchase the company with.
- *A stock swap is when a company purchases another company by issuing new stock of the combined company to the old owners of the company being acquired, rather than paying in cash.*

What is a cash offer?

- *A cash offer is payment for the ownership of a corporation in cash.*

Why pay in stock versus cash?

- *If a company pays in cash, the owners receiving the cash will need to pay taxes on the cash received. Additionally, if the owners of the company being acquired want to be a part of the new company, they will prefer to gain stock. Current market performance may also affect the stock/cash decision. If the market is performing poorly, or is highly volatile, the company being acquired may prefer cash.*

What is a tender offer?

- A tender offer occurs during a hostile takeover, when the acquiring company offers a higher price than the stock's market price in an attempt to gain controlling interest of a company.
- In a hostile tender offer Company A wants to acquire Company B, but B refuses. A therefore issues tender offering. When this occurs, Company A will take advertisements in newspapers to buy stock of B at a price much above the market price. For example, Company A will offer to pay $30 for shares currently trading at $15 in an attempt to gain ownership of more than 50% of the stock and ownership of the business as a whole.
- *A tender offer is usually a hostile takeover technique. It occurs when the acquiring company offers to purchase the stock of the target company for a price over the current market price in an attempt to take control of the company without management approval.*

Describe a recent M&A transaction you have read about?

- This is similar to the recent IPO question. It is simply to see your general interest in the markets. Look in the Wall Street Journal, Financial Times or dealbook.blogs.nytimes.com/ to get information about recent

M&A transactions. Know the companies involved, whether it was a merger or an acquisition, the price paid, the banks working on the deal, etc. Also know the reasons behind the M&A transaction.

If Company A purchases Company B, what will the combined company's balance sheet look like?

- *The new balance sheet will simply be the sum of the two company's balance sheets.*

Name two companies you believe would benefit from merging?

- This is another question that doesn't have a right or wrong answer and is more to see how you think
- Come up with two companies that could benefit from a merger (think synergies, gaining market share, etc)
- Make sure that the two companies you choose would create a monopoly if they were became one

Advanced

What is the difference between and accretive merger and a dilutive merger?

- Accretive: When the acquiring company's earnings per share will increase post-merger
- Dilutive: When the acquiring company's earnings per share will decrease post-merger
- If the P/E ratio of the acquiring company is higher than the P/E ratio of the company being acquired, the deal is accretive, and vice versa
- Company 1 is purchasing, Company 2 is being purchased

P/E Ratio Relationship	Merger Type
$P/E_1 > P/E_2$	Accretive
$P/E_1 < P/E_2$	Dilutive

- *A merger is considered accretive if the acquiring company's EPS increases due to the merger and vice versa.*

Company A is considering acquiring Company B. Company A's P/E ratio is 50 times earnings, whereas Company B's P/E ratio is 20 times earnings. After Company A acquires Company B, will Company A's earnings per share rise, fall, or stay the same?

- *Since the P/E of the firm doing the purchasing is higher than the firm it is purchasing, the new company's EPS will be higher, therefore creating an accretive merger.*

You are advising a client in the potential sale of the company. Who would you expect to pay more for the company: a competitor, or an LBO fund?

- *You would expect a competitor who is a strategic buyer to pay more for the given company. This is due to the fact that strategic buyers would derive additional benefits (synergies) and therefore higher cash flows from the purchase than would an LBO fund which is a financial buyer.*

Are most mergers stock swaps or cash transactions and why?

- *In strong markets, most mergers are stock swaps mainly because the prices of companies are so high, as well as the fact that the current owners will most likely desire stock in the new company, anticipating growth in the strong market.*

What is a leveraged buyout? How is it different from a merger?

- A LBO occurs when a group, usually a private equity firm, purchases a company using a very large amount of debt. They then pay off the debt over the course of the time they own the company using the company's cash flow. After they pay down the debt, they can sell the company and keep 100% of the sale price since they now own it 100% equity.
- For example, a PE firm purchases a company for $100mm, using $20mm in equity and borrowing $80mm in cash. Over the course of 10 years, they pay off the debt using the company's cash flow. Even if the company's value does not increase over the 10 years, if the firm now sells the company for $100mm, they have returned $100mm on only a $20mm investment, a significant return.
- They are accomplished by financial groups, whereas M&A deals are led by companies in the industry.
- *Essentially, an LBO takes place when a firm wants to buy a company now with the simple intention of selling it in the future and potentially changing management to increase the company's profitability. What makes it a LEVERAGED buyout is the fact that the acquiring firm will fund the purchase the company with a relatively high level of debt and then pay off the debt with the cash flows produced by the firm. This means that by the time they are ready to sell the company, they will own 100% of the equity, and will collect 100% of the selling price.*

What are the three types of mergers and what are the benefits of each?

- The three types of mergers are horizontal, vertical and conglomerate. A horizontal merger is a merger with a competitor and will hopefully result in synergies. A vertical merger is a merger with a supplier or distributor and will hopefully result in cost cutting. A conglomerate merger is a merger with a company in a completely unrelated business and is most likely done for market or product expansions, or to diversify and limit risk exposure.

What are some defensive tactics that a target firm may employ to block a hostile takeover?

- A poison pill shareholder rights plan gives existing shareholders the right to purchase more shares at a discount in the event of a takeover, making the takeover less attractive by diluting the acquirer. Shareholder stock repurchase program
- A Pac-Man defense is when the company which is the target of the hostile takeover turns around and tries to acquire the firm that originally attempted the hostile takeover.
- A white knight is a company which comes in with a friendly takeover offer to the target company which is being targeted in a hostile takeover.

Other

If you worked in the finance division of a company, how would you decide whether or not to invest in a project?

- *In order to decide, you will determine the IRR of the project. The IRR is the discount rate which will return an NPV of 0 of all cash flows. If the IRR of the project is higher than the current cost of capital for the project, then you would want to invest in the project.*

What are some recent trends in investment banking?

- Consolidation: Banks being acquired by other banks. JPMorgan buying Bear Stearns, Barclays buying part of Lehman Brothers, etc.
- Capital Infusions: Buffett investing in Goldman Sachs, Mitsubishi investing in Morgan Stanley
- Global Expansion: Firms looking to expand into other, fast growing nations
- Technology: High technology is being used to execute trades, and distribute information more quickly

What is an institutional investor?

- *An institutional investor is an organization that pools together large sums of money and puts that money to use in other investments. Some examples of institutional investors are investment banks, insurance companies, retirement funds, pension funds, hedge funds, and mutual funds. They act as specialized investors who invest on behalf of, and in the best interest of, their clients.*

What is a hedge fund?

- *A hedge fund is a loosely regulated investment pool. Generally they are only open to high net worth individuals or institutional investors since they are limited to 100 or 500 investors. They use many strategies to hedge against risk with the goal of making a profit in any market environment and take high risk and sometimes are highly leveraged to give their clients high reward. They can invest in whatever they want because they do not follow the limits and regulations that other mutual funds must.*

What is securitization?

- *Securitization is when an issuer bundles together a group of assets and creates a new financial instrument by combining those assets and reselling them in different tiers called traunches.*
- Mortgage backed securities are probably the most widely known type of securitized asset. A bank will take a pool of mortgages they issued, and sell off the future cash flows (mortgage payments) from those mortgages to another investor.

Brainteasers

There is no way to prepare for every brainteaser. There are many that are commonly used in interviews and you can prepare for those, but remember answering the brainteaser the way the interviewer wants to hear it answered is more important than actually getting the answer correct (but try and get it correct as well). Remember not to lose your cool.

What's 17 squared? What's 18x22?

- Don't worry; they want to know how you will handle this question and it is not difficult if you think about it the correct way.
- Think 17x10 plus 17x7. Break 17x7 down into 10x7 and 7x7. This gives you 170+70+49, which gives you 289. Whatever you do don't panic and practice these types of quetions.
- Same idea applies to 18x22, break it down. Do 18x20 + 18x2. Easy, 360 + 36=396.
- As far as brainteasers go, this is a rather common one.

How many NYSE-listed companies have 1 letter ticker symbols?

- 26, actually 24 because I & M is used for Intel and Microsoft in case they change their minds.

How many gas stations are in the United States?

- With a question like this, the interviewer is looking at your thought process, not that you can actually figure out how many gas stations are in the U.S.
- The easiest way to go about answering a question like this is to start small and work your way out. Think about your town. Say your town has 30,000 people, and you have 5 gas stations serving that area. The United States has approximately 300 million people, so that means there are 10,000 "towns" in the United States, and 50,000 gas stations.
- You then want to make adjustments. For example. Say assume that a quarter of the population lives in larger cities where there is only 1 gas station per 30,000 people. So you have 7,500 towns with 5 gas stations and 2,500 "towns" with only 1. Do a little mental math, and you get a number of 40,000 gas stations in the U.S.

If you were going to build a building in a city, and had no physical restraints, no capital restraints, nothing, how tall would you build it?

- This question is similar to the question above in that there is no right or wrong answer.
- They are not looking for an actual height in feet, but more what kind of things you would think about in determining the height.
- Some things to think about:
  - Measuring the demand for space in a new building
  - How high people would be willing to purchase space due to safety concerns
  - How much you can sell the space for in comparison with how much it costs to maintain
  - How much the demand for the space will grow over the life of the building, so how much extra space should you build into the design

You are late for a pitch with the CEO of a company in the Town of Truth. You are speeding down a road that suddenly forks, and there are no signs. You know that one way leads to the Town of Truth where everyone tells the truth and the other way leads to the Town of Lies where everyone tells lies. There is a guy standing there at the crossroads and you don't know which town he's from. You only have time to ask him one question…. So what do you ask him?

- The key to this question is to ask a question to which both guys would point the same direction. You could ask them to point to which town they are from (in which case they would both point to the town of truth).

You have a five gallon container and a three gallon container with no markings. You are standing next to a hose. Measure exactly two gallons of water.

- This is one of the more common brainteasers. If you are smart and want to look good, you should sit there and "ponder" the answer for a few seconds, like you are working it out in your head, not that you simply memorized the answer. There are also other versions of this question, so don't just hear "you have a five gallon container..." and assume it's this answer.
- You first fill the 5 gallon container then dump it into the 3 gallon container, leaving you with 2 gallons in the 5 gallon container.

How many degrees are there between a clock's two hands when the clock reads 3:15?

- The quick thought would be 90 degrees, but it isn't. If the clock is 360 degrees, the minute hand will be exactly at the 90 degree mark. The hour hand will be ¼ of the way between the 3 and the 4. Since there are 12 numbers the 3 and the 4 are 30 degrees apart, making the hour hand 7.5 degrees beyond the 3, and 7.5 degrees from the minute hand.

A stock is trading at 10 and 1/16. There are 1 million shares outstanding. What is the stock's Market Cap?

- This is just a test of your mental math. If a fourth is .25, an eight is .125, and a sixteenth is .0625.
- The stock price is 10.0625 and the Market Cap is 10.0625 million.

Exhibit 1

Income Statement

Revenue
-Cost of Goods Sold
Gross Profit
-Operating Expenses
-Depreciation
-Amortization
Operating Income
-Interest Expense
Pre-Tax Income
-Taxes
Net Income

Balance Sheet

Assets
Current Assets (incl. cash)
Long-Term Assets

Liabilities
Current Liabilities
Long-Term Liabilities

Shareholder's Equity
Common Stock
Retained Earnings

Cash Flow Statement

Beginning Cash

Cash Flow from Operations
Net Income
+/- Non-Cash Items
Depreciation
Amortization
Change in Work. Cap.

Cash Flow from Investing
Capital Expenditures
Other Investments

Cash Flow from Financing
Dividends
Cash Raised/Spent on Debt
Cash Raised/Spent on Equity

Ending Cash